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WHITALL HALL, of Haverford College, which houses the scientific departments, was damaged by fire on April 8, with a loss estimated at \$20,000.

THE board of trustees has approved plans for an addition to the Women's School of the Carnegie Institute of Technology.

NEW buildings of the Sorbonne, Paris, have been erected at a cost of 782,000 francs. They are the Curie laboratory, under the direction of Mme. Curie; the radium laboratory, under the direction of M. Debierne, and the Pasteur laboratory, under the direction of M. Regnaud.

PROFESSOR ALEXANDER SMITH, administrative head of the department of chemistry in Columbia University, has accepted the position of professor of chemistry on the Wyman Foundation in Princeton University, and the headship of the department of chemistry. By the desire of the authorities of Columbia University, as well as his own, he will complete three years of service with Columbia University and will accept this call to take effect at the end of the academic year 1913-14.

DR. WILLIAM TRELEASE, director of the Missouri Botanical Garden from 1889 to 1912, has accepted the position of professor of botany and head of the department of botany at the University of Illinois.

DISCUSSION AND CORRESPONDENCE ON METHODS OF TEACHING MODERN LANGUAGES

THE basis and warrant of all language teaching must be psychological. But among all the multitudinous articles and books on the subject, there are only a very few which take cognizance of the psychology of language teaching, although, to be sure, the practical application of the principles is practised in part, consciously or unconsciously.

The test of any method must be psychological. Here mere practical results can not be the criterion. The question should not be: Has the learner acquired so and so much of a vocabulary? but rather it should be: Has the learner been acquiring good *mental habits* while he has been acquiring the vocabulary? That is to say, the method must be based upon

sound laws of the mind, to follow which means to produce good *habits of study*.

1. The newer school of linguists are agreed that language is an activity of the mind; not a thing thrust upon the individual, but rather the outward manifestation of mental states.

Speech without ideas is useless. Adults do not naturally learn words for the sake of learning them, but only for the purpose of expressing ideas. We find in normal adults first the idea, then the expression of it, or possibly the two simultaneously, but not the reverse.

2. Physiological psychology teaches us that four distinct centers of the brain are active in the acquisition of language; namely: the auditory, the visual, the motor writing, and the motor speech centers, the first two sensory, the latter two motor.¹ The function of the auditory center is to receive sensory impressions through the nerves of the ear; that of the visual center to receive impressions from the nerves of the eye; the motor-writing center controls the muscles of the hand in writing, while the motor speech center controls the muscles of the speech organs.

It has been established, also, by experimentation that the strength of the sensory impressions upon these centers varies with different individuals. There are those who get stronger impressions by the auditory than by the visual center, and more facile expression by the motor-speech than by the motor-writing center, and *vice versa*.

Moreover, there are in the case of the four brain centers under discussion not only nerve currents from the end-organs to the centers and from the motor centers to the muscles, there are also the association areas of the brain which serve communication between these centers, thereby bringing about a lively interaction between them.

3. Without going into the old question whether sensation is the sole principle of knowledge, we are on safe ground psycholog-

¹ Cf. Wundt, Wilhelm, "Principles of Physiological Psychology," English translation, London and New York, 1904, pp. 302 ff.; Judd, C. H., "Psychology, General Introduction," New York, 1907, pp. 51 ff.

ically when we assert that in learning a language auditory, visual and kinesthetic sensations play the most important rôle, and are in fact the basis of knowledge. It follows then that the greater the number of sensory impressions that can be enlisted in the acquisition of language, the greater the acquisition. It follows also that the more combined the activity of the senses, the more rapid and the more thorough will be the organization of the speech centers physically and psychically.

4. From perceiving sensations, that is, from percepts, the mind proceeds, by discriminating, comparing, judging from knowns to unknowns, to form concepts.

5. Retentivity depends for its strength upon the strength of the original impression and upon the frequency of repetition. It shows greatest virility in the retention of linguistic forms when the four speech centers operate to heighten the intensity of the impression.

6. Beyond this there is the ideal of persistence which is strengthened by resolutely overcoming obstacles, *e. g.*, by mastering assigned tasks of difficulty sufficient to form a real obstacle to their consummation.

What do these facts mean to the teacher of language, and how should pedagogy make use of them?

1. It is unnatural and hence poor pedagogy to teach isolated words, and to proceed from the parts to the whole; that is, here, from the isolated vocables to the sentence, the judgment. The reverse: from a consideration of the whole sentence to a consideration of the parts is the law of nature, and is a good psychological principle.

Thus the argument which is often used against the analytical or direct method that adults do not learn language like children do loses much of its force. Certain it is that for adults the idea comes before the sign for the idea, although, to be sure, the mature mind, accustomed to abstract thinking, soon demands that it be given not only the percepts but the concepts, and the general concepts as well.

2. Good pedagogy should call into activity

all the powers of the mind of the learner. Thus in the case of the language teacher, to utilize the visual and the graphic centers only, and allow the auditory and the motor speech centers to lie barren, is to get only a portion of the sensory impression that may be got if all the centers are utilized.

Again, since some individuals of a group will learn better by the utilization of the visual and the graphic centers, others by the utilization of the auditory and the motor-speech centers, etc., every course in language should give opportunity for both forms of impressions and both forms of expression, *i. e.*, for hearing, and seeing (reading); for speaking and writing.²

3. Language study is best cultivated by utilizing the nervous energy of all four centers, that is, the ear, the eye, the vocal organs and the hand. Each must support the other, thus heightening the total impression.

4. Generalizations, in this case principles and laws, must base upon sense perceptions, in this case spoken or written words and phrases, and must follow, not precede them. Ample opportunity is demanded to discriminate between various cases, genders, numbers, persons, tenses, modes, etc.; also between the various shades of meaning in words, and various modes of expression with slightly varying significance; also opportunity to make combinations as in reasoning from known roots to the various compounds of such roots, etc.; also opportunity for comparisons as in comparing the idioms of the foreign tongue with the mother tongue, as *e. g.*, in translating.

5. Retentivity depends upon the strength of the impression received in the class room. Aural impressions are heightened by visual, graphic and oral impressions. Since retentivity depends upon the frequency of the im-

² It has been claimed that Americans are visualizers, and from this it has been argued that the reading method is the best for Americans. But it is a patent fact among psychologists that the combined action of the four speech centers is stronger than that of any one of them, and thus this argument falls flat. Moreover, the visualizer, above all others, needs to have his auditory and other centers developed.

pressions, language material must be worked over repeatedly in various ways, thereby insuring permanence of the impressions. The natural association of name and object must be made use of. That is, the learner shall not be taught to think from the foreign symbol to the symbol of the mother tongue, and from that to the object, but he shall be taught to think in the foreign language from the thing to the name and *vice versa*, just as he does in the mother tongue.

6. The ideal of persistence must be enforced by accomplishing set tasks, tasks sufficiently difficult, and including not merely memory work but reasoning as well, as, for instance, translation and "free composition," in which he compares and discriminates, chooses and rejects.

The imagination, the esthetic and the moral feelings must be fed by reading literature of high moral and esthetic standard, and by laying emphasis on the qualities which are to be inculcated.

CHARLES HART HANDSCHIN

ACADEMIC FREEDOM

TO THE EDITOR OF SCIENCE: In the current issue of SCIENCE is a letter on the subject of academic freedom, in which is given a quotation from an address delivered some years ago by President Schurman. Your correspondent regards the statements in the address as highly commendable, but it seems to me that the address contains within itself the "enzym" of its decomposition.

Academic freedom is like friendship "but a name that lures the soul to sleep." Freedom of teaching is permitted only so long as no serious attack is made on widely received opinions. As the "Professor" says, in Mallock's "New Paul and Virginia," "Opinions can only be tolerated when they lead to no possible consequences." Let us suppose, for instance, that when Professor Schurman's address was published, a subordinate instructor in the university had spoken as follows: "When President Schurman speaks of 'God's truth' he speaks of something about which he knows no more than a gibbering idiot in

the nearest asylum. God, if he exists, has apparently not declared himself to anybody. All such allusions are either mere catering to popular superstitions, or are on the same plane as the beliefs of the lowest savages." How long would this instructor retain his place in the university? I would be pleased to hear what your correspondent would advocate concerning a person who should so express himself. A hundred other examples can be selected. What would become of a subordinate instructor who should at a Washington's birthday address say that Washington was a traitor and should have been hanged by the British, if they had caught him.

HENRY LEFFMANN

WHEN the necessity of freedom for university teachers and investigators is emphasized, it is never assumed that this freedom carries with it a license to do or say anything and everything. University teachers do not claim that they constitute a class with special privileges. But as a body of men with serious and important work to do, they claim the freedom that is necessary to enable them to perform this work and to fulfill their obligations to society. Freedom in this field, as everywhere, is a reasonable freedom, involving law, responsibility and due regard for others. Academic freedom has its roots and its justification in the duty which the teacher owes to his students and to the community. It may well be that at times it is just as important to emphasize this duty and responsibility as to call attention to the necessity of freedom. But one side is the counterpart and complement of the other: where there is no freedom there can be no responsibility, and where there is no feeling of responsibility there can be no genuine freedom. If this is true, it would seem to follow that the limits of a reasonable freedom can not be fixed by any abstract definition. What are the reasonable limits in any particular case must be decided by the whole set of circumstances, as judged by reasonable men living in a reason-